

CLAIMS

What is claimed is:

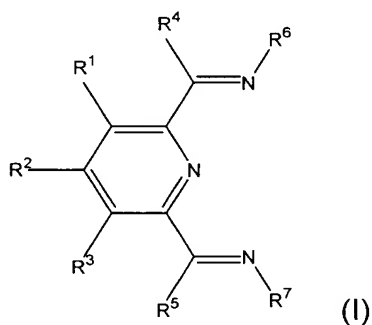
1. A process for the preparation of α -olefins, comprising,
contacting at about 40°C to about 120°C in a liquid full modified plug flow
5 reactor:

- (a) an oligomerization catalyst which is an iron complex of a
2,6-pyridinecarboxaldehyde(bisimine) or a 2,6-
diacylpyridine(bisimine) which oligomerizes ethylene to α -
olefins;
- 10 (b) ethylene;
- (c) an organic solvent; and
- (d) optionally one or more cocatalysts;

wherein (a) plus (b) plus (c) plus (d), when present, form a process
mixture, and wherein along the length of said modified plug flow reactor
15 said oligomerization catalyst is added at two or more first addition points to
said process mixture, so that a time interval for said process mixture
between said addition points is about 0.3 to about 5 half lives of said
oligomerization catalyst under process conditions.

2. The process as recited in Claim 1 wherein said time interval is
20 about 0.5 to about 3.0 of said half lives.

3. The process as recited in Claim 1 wherein said 2,6-
pyridinecarboxaldehyde(bisimine) or 2,6-diacylpyridine(bisimine) is



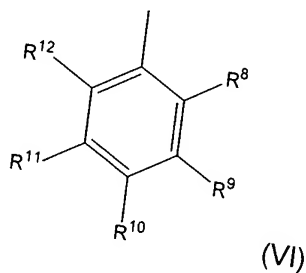
25 wherein:

R¹, R² and R³ are each independently hydrogen, hydrocarbyl,
substituted hydrocarbyl or an inert functional group, provided that any two
of R¹, R² and R³ vicinal to one another taken together may form a ring;

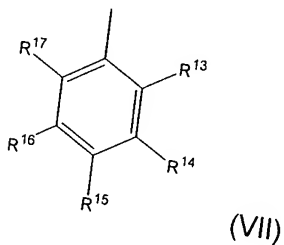
R⁴ and R⁵ are each independently hydrogen, hydrocarbyl,
30 substituted hydrocarbyl or an inert functional group;

R^6 and R^7 are each independently a substituted aryl having a
 first ring atom bound to the imino nitrogen, provided that:
 in R^6 , a second ring atom adjacent to said first ring atom is
 bound to a halogen, a primary carbon group, a secondary carbon group or
 a tertiary carbon group; and further provided that
 in R^6 , when said second ring atom is bound to a halogen or a
 primary carbon group, none, one or two of the other ring atoms in R^6 and
 R^7 adjacent to said first ring atom are bound to a halogen or a primary
 carbon group, with the remainder of the ring atoms adjacent to said first
 ring atom being bound to a hydrogen atom; or
 in R^6 , when said second ring atom is bound to a secondary
 carbon group, none, one or two of the other ring atoms in R^6 and R^7
 adjacent to said first ring atom are bound to a halogen, a primary carbon
 group or a secondary carbon group, with the remainder of the ring atoms
 adjacent to said first ring atom being bound to a hydrogen atom; or
 in R^6 , when said second ring atom is bound to a tertiary carbon
 group, none or one of the other ring atoms in R^6 and R^7 adjacent to said
 first ring atom are bound to a tertiary carbon group, with the remainder of
 the ring atoms adjacent to said first ring atom being bound to a hydrogen
 atom.

4. The process as recited in Claim 3 wherein
 R^6 is



and R^7 is



wherein:

R⁸ is a halogen, a primary carbon group, a secondary carbon group or a tertiary carbon group; and

R⁹, R¹⁰, R¹¹, R¹⁴, R¹⁵, R¹⁶ and R¹⁷ are each independently
5 hydrogen, hydrocarbyl, substituted hydrocarbyl or a functional group;
provided that:

when R⁸ is a halogen or primary carbon group none, one or two
of R¹², R¹³ and R¹⁷ are a halogen or a primary carbon group, with the
remainder of R¹², R¹³ and R¹⁷ being hydrogen; or

10 when R⁸ is a secondary carbon group, none or one of R¹², R¹³
and R¹⁷ is a halogen, a primary carbon group or a secondary carbon
group, with the remainder of R¹², R¹³ and R¹⁷ being hydrogen; or

when R⁸ is a tertiary carbon group, none or one of R¹², R¹³ and
R¹⁷ is tertiary carbon group, with the remainder of R¹², R¹³ and R¹⁷ being
15 hydrogen;

and further provided that any two of R⁸, R⁹, R¹⁰, R¹¹, R¹², R¹³,
R¹⁴, R¹⁵, R¹⁶ and R¹⁷ vicinal to one another, taken together may form a
ring.

5. The process as recited in Claim 4 wherein:

20 if R⁸ is a primary carbon group, R¹³ is a primary carbon group,
and R¹² and R¹⁷ are hydrogen; or

if R⁸ is a secondary carbon group, R¹³ is a primary carbon
group or a secondary carbon group, more preferably a secondary carbon
group, and R¹² and R¹⁷ are hydrogen; or

25 if R⁸ is a tertiary carbon group (more preferably a trihalo tertiary
carbon group such as a trihalomethyl), R¹³ is a tertiary carbon group
(more preferably a trihalotertiary group such as a trihalomethyl), and R¹²
and R¹⁷ are hydrogen; or

30 if R⁸ is a halogen, R¹³ is a halogen, and R¹² and R¹⁷ are
hydrogen.

6. The process as recited in Claim 4 wherein:

R¹, R² and R³ are hydrogen; and R⁴ and R⁵ are methyl;

R¹⁹, R²⁰, R²¹, R²³ and R²⁴ are all hydrogen; R²² is methyl; and
R¹⁸ methyl; or

35 R¹⁹, R²⁰, R²¹, R²³ and R²⁴ are all hydrogen; R²² is ethyl; and
R¹⁸ ethyl; or

R¹⁹, R²⁰, R²¹, R²³ and R²⁴ are all hydrogen; R²² is isopropyl;
and R¹⁸ isopropyl; or

R¹⁹, R²⁰, R²¹, R²³ and R²⁴ are all hydrogen; R²² is n-propyl; and R¹⁸ n-propyl; or

R¹⁹, R²⁰, R²¹, R²³ and R²⁴ are all hydrogen; R²² is chloro or bromo; and R¹⁸ is a halogen.

5 7. The process as recited in Claim 1 which is carried out at a temperature of about 70°C to about 110°C.

8. The process as recited in Claim 1 wherein there are about 3 to about 8 of said addition points.

10 9. The process as recited in Claim 1, 2, 3, 4, 5, 6, 7, 8 or 9 wherein ethylene is added at two or more second addition points to said process mixture.

10. The process as recited in Claim 9 wherein said first addition points and said second addition points are the same.